What is claimed is:

1. A data exchange system comprising:

at least one transmitting agent for transmitting data;

at least one receiving agent for receiving data wherein said at least one receiving agent comprises a sequence counter for sequentially numbering the data as received by the at least one receiving agent; and

a plurality of data links connected between said at least one transmitting agent and said at least one receiving agent wherein each of the plurality of data links includes a crossbar.

2. The data exchange system of claim 1 wherein said at least one transmitting agent includes a transmit queue having a plurality of memories wherein the data to be transmitted are stored.

3. The data exchange system of claim 1 wherein said at least one receiving agent includes a receive queue having a plurality of memories wherein the data that has been received are stored.

4. The data exchange system of claim 1 wherein each of said at least one transmitting agents includes a transmit link queue having a plurality of memories wherein the data that is being transmitted are stored.

5. In a data exchange system having a transmitting agent for transmitting data and a plurality of data links connected between the transmitting agent and a receiving agent, and wherein each of said plurality of data links includes a crossbar, a sequence counter associated with said receiving agent for sequentially numbering the data as received.

6. The apparatus of claim 5 wherein said transmitting agent comprises a transmit queue having a plurality of memories wherein the data to be transmitted is stored and wherein the transmitting agent includes for each of the plurality of data links a transmit link queue having a plurality of memories wherein the data that is being transmitted is stored, and said receiving agent further includes a receive queue having a plurality of memories wherein the data that has been received is stored.

7. A data exchange system comprising:

at least one transmitting agent for transmitting data;

at least one receiving agent for receiving data wherein said at least one receiving agent includes a sequence counter for sequentially numbering the data as received by said at least one receiving agent;

a plurality of data links connected between said at least one transmitting agent and said at least one receiving agent wherein each of said plurality of data links includes a crossbar;

means for transmitting data from the same Order Critical Flow on the same data link; and

means for processing data by said at least one receiving agent in the sequential order in which the data was received.

8. The data exchange system of claim 7 wherein said at least one transmitting agent includes a transmit queue having a plurality of memories wherein the data to be transmitted is stored.

9. The data exchange system of claim 7 wherein said at least one receiving agent includes a receive queue having a plurality of memories wherein the data that has been received is stored.

10. A data communications system, comprising:

a transmitting agent having a transmit queue including data to be transmitted and a first and second transmit link queue;

a receiving agent having a receive queue for receiving said data and a first and second receive link queue;

a first data link coupling said first receive link queue to said first transmit link queue;

a second data link coupling said second receive link queue to said second transmit link queue;

means for moving said data from said transmit queue to one of said first and second transmit link queues prior to transmission of said data over said first and second data links;

means for determining if any of said data belongs to an order critical flow;

means for directing all of said data belonging to a particular order critical flow over a selected one of said first and second data links.

11. A data communications system according to claim 10, wherein said transmit queue includes a plurality of packet memories for storing said data in the form of packets.

12. A data communications system according to claim 11, wherein said transmit link queues are coupled to said transmit queue and each said transmit link queue includes a plurality of packet memories for storing data in the form of packets.

13. A data communications system according to claim 12, wherein at least one of said first and second data links includes a crossbar.

14. A data communications system according to claim 12, wherein each of said first and second data links include a crossbar.

15. A data communications system according to claim 14, wherein said receiving agent includes a sequence counter for generating packet sequence numbers and further comprising means for sequentially numbering packets received at said first and second receive link queues in the order in which they begin to be received.

16. A data communications system according to claim 15, wherein said first and second receive link queues each include a plurality of packet memories for storing data received over said respective first and second data links in the form of packets.

17. A data communications system according to claim 16, wherein said receive queue includes a plurality of packet memories for storing data received from said first and second receive link queues in the form of packets.

18. A method of transmitting a stream of packets including at least one Order Critical Flow of packets from a transmitting agent to a receiving agent linked by a plurality of data links, said method preserving the order of the Order Critical Flow of packets, said method comprising the steps of:

applying the stream of packets to a transmit queue of the transmitting agent;

determining if a packet next in order for transmission within the transmit queue is part of an Order Critical Flow of packets;

transmitting said packet next in order over a selected one of the data links, said selected one corresponding to the data link used by the last packet belonging to the same Order Critical Flow if any packets from said Order Critical Flow of packets remain in the transmitting agent.

19. A method in accordance with claim 18, further comprising the steps of:

receiving said packet next in order at the receiving agent; and

assigning said packet a sequence number based upon the order of the start of receipt by the receiving agent; and

reassembling packets received at the receiving agent in an order preserving the order of Order Critical Flows of packets.